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node degree used for link cost

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Pricing multicast communication: A cost-based approach - >> psu.edu [For]

JC Chuang, MA Sirbu - Telecommunication Systems, 2001 - Springer

... This is consistent with general Internet routing today, where hop-count is the widely **used** metric for route cost ... Lu is clearly network-specific - it is influenced by topological factors such as the number of nodes and **links** in the network, average **node degree**, network diameter ...

Cited by 188 - Related articles - Bl. Direct - All 13 versions

The trade-offs of multicast trees and algorithms - > kfupm.edu.sa [PDF]

L Wei, D Estrin - In Proceedings of the 1994 international ..., 1994 - eprints.kfupm.edu.sa

- ... a unidirectional link as a simple measure of the degree of trac concentration. ... large scale networks, eg limited knowledge of global topology at each network node and need ... verse shortestpaths
- 2 ,ordistributed linkstateprotocols such as MOSPF can be used to compute shortest ...

Cited by 151 - Related articles - View as HTML - All 3 versions

[PDF] ➤ Evaluation of multicast routing algorithms for real-time communication on high- ...

HF Salama, DS Reeves, Y Viniotis - IEEE Journal on Selected Areas in ..., 1997 - Citeseer ... is approximately the average **node degree** of current networks. Figure 1 shows an example of a randomly generated ... Each node represented a non-blocking ATM switch, and each link had a small output buffer. ... For the MC sources we used variable bit rate (VBR) video sources. ... Cited by 306 - Related articles - View as HTML - BL Direct - All 12 versions

[PDF] № On the placement of internet instrumentation

S Jamin, C Jin, Y Jin, D Raz, Y Shavitt, L Zhang - IEEE INFOCOM, 2000 - Citeseer

... link costs satisfying the triangle inequality, 3 and an integer K, find a set of K nodes such that the maximum distance between a **node** on the graph and the nearest center is minimized. We present two algorithms below, each of which can be used to solve both the Number of ... Cited by 245 - Related articles - View as HTML - BL Direct - All 38 versions

A key-management scheme for distributed sensor networks - ➤ psu.edu [Por]

L Eschenauer, VD Gligor - Proceedings of the 9th ACM Conference on ..., 2002 - portal.acm.org ... its neighbors in wireless communication range, as long as multi-link paths of shared keys exist among neighbors that can be used to setup ... key exists between two sensor nodes, n be the number of network nodes, and d = p * (n - 1) be the expected **degree** of a **node** (ie, the ... Cited by 1710 - Related articles - All 52 versions

[PDF] ► A disjoint path selection scheme with shared risk **link** groups in GMPLS networks

E Oki, N Matsuura, K Shiomoto, N Yamanaka - IEEE Communications letters, 2002 - comsoc.org ... is used as a parameter to judge whether the binary search method converges. ... For all s, if , all links, where, are also pruned. ... evaluate the WSRLG performance, we use network topologies generated in a random manner under the condition that average node degree is satisfied ... Cited by 56 - Related articles - View as HTML - BL Direct - All 5 versions

A distributed algorithm for delay-constrained unicast routing - >> psu.edu [PDF]

HF Salama, DS Reeves, Y Viniotis - IEEE INFOCOM, 1997 - doi.ieeecomputersociety.org ... distance vector at each **node** to be periodically transmitted to direct neighbors of that **node** only ... The same procedures **used** for maintaining the distance vectors can be **used** for maintaining the **cost** ... We also assume that the **link costs**, the **link** delays, the contents of the **cost** vectors ... Cited by 164 - Related articles - BL Direct - All 15 versions

[рьг] ≫ Local search genetic algorithm for optimal design of reliable networks

B Dengiz, F Altiparmak, AE Smith... - IEEE Transactions on Evolutionary ..., 1997 - Citeseer

... node. For example, node 2 of the right-hand network of Figure 1 has node degree = 3. 3.2 INITIAL POPULATION ... Ullman [27], which grows a tree from a randomly chosen node. 2. Links selected randomly from the co-tree set (the set of links which are not yet used in the ... Cited by 131 - Related articles - View as HTML - BL Direct - All 10 versions

[PDF] Dimensioning of survivable WDM networks

B Van Caenegem, W Van Parys, F De Turck, PM ... - IEEE Journal on ..., 1998 - comsoc.org ... In WP networks, this becomes Whether or not a **link** is **used** can be expressed through the following constraints (for VWP as well as for WP networks): An additional constraint has been added for survivability reasons. The **node degree** must be minimal two. ... Cited by 191 - Related articles - View as HTML - BL Direct - All 7 versions

Bandwidth-delay-constrained least-cost multicast routing based on heuristic ...

W Zhengying, S Bingxin, Z Erdun - Computer communications, 2001 - Elsevier ... The searching process begins at the source s and randomly selects an unvisited **node** at each **node** for the next visit. ... t), t D), its value is 1, or else r(0<r<1). The value of r determines the **degree** of penalty ... The crossover operations **used** in our algorithm are described as follows. ... Cited by 84 - Related articles - All 2 versions

Topological optimization of a communication network subject to a reliability ... - ➤ 140.113.39.78 [PDF] RH Jan, FJ Hwang, ST Chen - 1993 - 140.113.39.78

... The objective is to find the topological layout of **links**, at a minimal **cost**, under the constraint ... A decomposition method, based on branch & bound, is **used** for solving the problem ... to speed-up the procedure, an upper bound on system reliability in terms of **node degrees** is applied ... Cited by 93 - Related articles - View as HTML - BL Direct - All 6 versions

[PDF] Power control and clustering in ad hoc networks

V Kawadia, PR Kumar - IEEE INFOCOM, 2003 - Citeseer

... The leader election, or the cluster set up phase, uses heuristics like **node** addresses, **node degrees**, transmission power, mobility, or more sophisticated **node** weights combining the above ... Cluster-heads can be **used** as base stations as in cellular networks in [20]. ... Cited by 375 - Related articles - View as HTML - BL Direct - All 36 versions

[рьт] № Designing communication network topologies using steady-state genetic ...

H Sayoud, K Takahashi, B Vaillant - IEEE Communications Letters, 2001 - comsoc.org ... A Dijkstra-based algorithm is **used** to add back the minimum **cost links** that connects the dis- joint components. We also **used** a depth-first search algorithm to check whether a topology is biconnected, that is any topology that has one or more nodes with **node degree** Cited by 36 - Related articles - View as HTML - BL Direct - All 4 versions

Search in power-law networks - > arxiv.org [PDF]

LA Adamic, RM Lukose, AR Puniyani, BA Huberman - Physical review E, 2001 - APS ... the highest **degree node** has been visited, it will be avoided, and a **node** of approximately ... is the most efficient way to do this kind of sequential search, visiting highest **degree** nodes in ... SIMULATIONS, 22 We **used** simulations of a random network with a power2.1 to validate our ... Cited by 722 - Related articles - BL Direct - All 30 versions

[PDF] The trade-os of multicast trees and algorithms

L Wei, D Estrin - International Conference on Computer ..., 1994 - Citeseer ... a simple measure of the **degree** of trac concentration ... the above evaluation criteria, we bear in mind the restrictions of real world large scale networks, eg limited knowledge of global topology at each network **node** and need ... as MOSPF can be **used** to compute shortest path trees9 ... Cited by 59 - Related articles - View as HTML - All 26 versions

An efficient delay-constrained multicast routing algorithm

Q Sun, H Langendörfer - Journal of High Speed Networks, 1998 - IOS Press

... each network **node** is ^2. Most of our experiments were conducted on networks with an average **node degree** of 4 ... Most of our simulation experiments **used** a value of 50 ms for ... the experiments conducted in [15] were only for networks with a random set of **links** connecting nodes ...

Cited by 53 - Related articles - Bt. Direct - All 2 versions

Cost-effective implementation of multicasting in wavelength-routed networks - > psu.edu [PDF]

M Ali, JS Deogun - Journal of Lightwave Technology, 2000 - opticsinfobase.org

... increases. The higher blocking in TaC networks is due to the relatively large number of optical fibers used in the multicast trail; thus forcing sessions sharing fiber links to use ... 18 shows the average maximum- delay as a function of **node degree**, , for different connection types. ... Cited by 81 - Related articles - BL Direct - All 16 versions

Topology aggregation for directed graphs - > kfupm.edu.sa [PDF]

B Awerbuch, Y Shavitt - IEEE/ACM Transactions on Networking (TON), 2001 - portal.acm.org ... Obviously, only links that belong to some shortest path are used, and specifically, links that are deleted to ... we pro- duce random graphs according to Waxman's method [10]. In the graph creation process, links are added until all nodes reach a minimum node degree of two ... Cited by 87 - Related articles - BL Direct - All 12 versions

[PDF] Meneycomb networks: Topological properties and communication algorithms

I Stojmenovic - IEEE Transactions on Parallel and Distributed Systems, 1997 - Citeseer ... to send the same message to all or some of its neighbors at once) is used, then the ... each node on the path applies "©" to reduce the informa- tion forwarded to the next node to a ... N ETWORK Honeycomb torus network can be obtained by joining pairs of nodes of degree two (ie ... Cited by 128 - Related articles - View as HTML - BL Direct - All 9 versions

On the minimum node degree and connectivity of a wireless multihop network - > itb.ac.in |ror|

C Bettstetter - Proceedings of the 3rd ACM international symposium ..., 2002 - portal.acm.org ... initions of graph theory and define the nomenclature used in this paper. 3.1 Node Degree The degree of a node u, denoted as d(u), is the number of neighbors of node u, ie, its number of links. A **node** of **degree** d = 0 is isolated, ie, it has no neighbors (see Fig. ...

Cited by 428 - Related articles - All 9 versions

Highly dynamic destination-sequenced distance-vector routing (DSDV) for mobile ... - >> psu.edu [PDF]

CE Perkins, P Bhagwat - ACM SIGCOMM Computer Communication ..., 1994 - portal acm.org ... method. Each node maintains a view of the network topology with a cost for each link. To keep these views consistent, each node periodical y broadcasts the link costs of its outgoing links to all other nodes using a protocol such as flooding. As a **node** receives this in- ... Cited by 4333 - Related articles - BL Direct - All 74 versions

Restoration strategies and spare capacity requirements in self-healing ATM ... - > mcgill.ca (PDF)

Y Xiong, LG Mason - IEEE/ACM Transactions on Networking (TON), 1999 - portal.acm.org ... 2. Very often, the connectivity of a network is measured by the network average node degree which is equal to the average number of **links** at each **node**. ... 3(20, 30) with is **used** as an example, which is a subnetwork of network 3 and consists of nodes 0-19. Fig. ... Cited by 213 - Related articles - BL Direct - All 16 versions

[PDF] Survivable routing of logical topologies in WDM networks

E Modiano, A Narula-Tam - IEEE INFOCOM, 2001 - Citeseer

... shown in figure 2. We attempted to embed random logical topologies of **degree** 3, 4, and 5, where we define a logical topology of **degree** k to be logical topology where every **node** has **degree** k. For each, we generated 100 random logical topologies and used the ILP to ... Cited by 98 - Related articles - View as HTML - BL Direct - All 11 versions

[PDF] Energy efficient communications in ad hoc networks using directional antennas

A Spyropoulos, CS Raghavendra - IEEE INFOCOM, 2002 - Citeseer

... techniques that have been suggested to save power, some of the most commonly used and successful ... That is, all nodes have a 360 o degree coverage angle and do not need to ... Some recent papers [1], [2] suggest the use of multiple directional antennas per node (or multiple ... Cited by 135 - Related articles - View as HTML - BL Direct - All 20 versions

[PDF] ➤ Network awareness and failure resilience in self-organising overlay networks

- L Massoulie, AM Kermarrec, A Ganesh PROCEEDINGS OF THE 2003 Citeseer
- ... The same mechanism can be **used**, at virtually no extra computation or communication **cost**, to balance **node degrees**. Balancing **degrees** not only helps to balance the load, but more importantly improves the resilience of the system to **link** and **node** failures. ... Cited by 59 Related articles View as HTML BL Direct All 11 versions

[PDF] Multicast routing and bandwidth dimensioning in overlay networks

SY Shi, JS Turner - IEEE Journal on Selected Areas in communications, 2002 - Citeseer ... It starts by determining the ideal **degree** of each **node** in the multicast session, with respect to the objective ... minimizing the diameter, without regard to **degree** constraints. ... the 50 largest metropolitan areas in US [25] and the geographic distances between cities was **used** as the ... Cited by 101 - Related articles - View as HTML - BL Direct - All 11 versions

[PDF] ➤ Host multicast: A framework for delivering multicast to end users

8 Zhang, S Jamin, L Zhang - IEEE INFOCOM, 2002 - Citeseer

... These members can be cached and **used** for partition recovery. ... Results presented here are based on simulations on a network consisting of 1000 nodes, representing routers, and 3300 **links**. ... 9). The maximum **node degree** constraint when running HMTP is set to eight. ...

Cited by 390 - Related articles - View as HTML - BL Direct - All 31 versions

[PDF] MA comparison of multicast trees and algorithms

L Wei, D Estrin - Proc. of IEEE Infocom, 1994 - Citeseer

... transmis- sions, SPT-based multicast already provides substan- tial savings in **link cost**, and it ... with relatively few globally-active multicastgroups, SPT's are satisfactory. The bandwidth is **used** for real ... simplest 3 reductions are: (1) For non-member vertex k whose **node degree** is 1 ... Cited by 37 - Related articles - View as HTML - All 11 versions

[PDF] ➤ GMPLS-based photonic multilayer router(Hikari router) architecture: an overview of ...

K Sato, N Yamanaka, Y Takigawa, M Koga, S ... - IEEE Communications ..., 2002 - Ics.poli.usp.br ... In BXCQ, the addition/elimination of **links** is iterated to solve a topological optimiza- tion problem with quality-of-service constraints, such as delay and blocking probability. ... Wavelength bandwidth is set to 2.5Gb/s. We **used** the metric of the average **node degree**, D, to ... Cited by 120 - Related articles - View as HTML - BL Direct - All 7 versions

[рьг] № Survivable lightpath routing: a new approach to the design of WDM-based ...

E Modiano, A Narula-Tam - IEEE Journal on Selected Areas in ..., 2002 - Citeseer ... 3. We attempted to embed random bi- directional logical topologies of **degree** 3, 4, and 5, where we define a logical topology of **degree** k to be logical topology where every **node** has **degree** k. ... topologies and **used** the ILP to find optimal survivable routing on the NSFNET. ... Cited by 109 - Related articles - View as HTML - All 10 versions

Search space reduction in QoS routing - > psu.edu [PDF]

L Guo, I Matta - Computer Networks, 2003 - Elsevier

... with least **cost**, this function is no longer suitable since it treats all **link** measures equally ... On the other hand, with our multiplicative function **used** in our DCCR algorithm, paths that are ... 5. Path distribution in **cost**-delay plane, network size=4000, **node degree** 4, negative correlation ... Cited by 75 - Related articles - BL Direct - All 12 versions

A distributed algorithm for delay-constrained unicast routing - >> psu.edu [PDF]

DS Reeves, HF Salama - IEEE/ACM Transactions on Networking (TON), 2000 - portal.acm.org ... vector at each **node** to be period- ically transmitted to direct neighbors of that **node** only ... The same procedures **used** for maintaining the distance vectors can be **used** for maintaining the **cost** vectors ... We also assume that the **link costs**, the **link** delays, the contents of the **cost** vectors ... Cited by 82 - Related articles - BL Direct - All 10 versions

Minimum-energy broadcast in all-wireless networks: NP-completeness and ... - ▶ psu.edu |PDF|

M Čagalj, JP Hubaux, C Enz - Proceedings of the 8th annual international ..., 2002 - portal.acm.org ... model and then, based on it we develop a graph model, which will be **used** to assess ... approximation ratio better than O(log d), where d rep- resents the maximum **node degree** in a ...

However, in metric space **links** and their respective **costs** are dictated by the dis- tances between ... Cited by 320 - Related articles - All 33 versions

Routing through networks with hierarchical topology aggregation - > kfupm.edu.sa [PDF]

B Awerbuch, Y Du, B Khan, Y Shavitt - Journal of High Speed ..., 1998 - eprints.kfupm.edu.sa ... of a **node** (external **links** not counted) to exceed four are rejected by the random process ... in one case (subnetwork 002 in gure 4), the algorithm failed to increase the **degree** of one ... the staged ring topology), when a constant **link cost** function (ie, min-hop routing) is **used** instead of ... Cited by 50 - Related articles - View as HTML - BL Direct - All 6 versions

On the reduction of broadcast redundancy in mobile ad hoc networks

W Peng, XC Lu - Proceedings of the 1st ACM international symposium ..., 2000 - portal.acm.org ... where d(u) is the **degree** of **node** u, dm (u) is the maximum **degree** of the neighbors ... Given a connected undirected graph G=(V, E), each **node** except the broadcast source receives at lease ... The physical and data **link** layer model is the same one **used** in previous works [6]. The ... Cited by 377 - Related articles - All 2 versions

QoS based routing algorithm in integrated services packet networks - > ieee-icnp.org [PDF]

C Pornavalai, G Chakraborty, N Shiratori - Journal of High Speed Networks, 1998 - IOS Press ... 6. Simulation results The communication networks **used** in our experiments are optical fiber, full duplex and directed, with homoge- neous **link** capacity bandwidth of 155.52 Mbps (OC3). ... Nodes of all these networks were so connected that the **degree** of each **node** is at least 2 ... Cited by 81 - Related articles - Bt. Direct - All 7 versions

Evaluating the impact of stale link state on quality-of-service routing - > psu.edu [PDF]

A Shaikh, J Rexford, KG Shin - IEEE/ACM Transactions on Networking (..., 2001 - portal.acm.org ... vary important parameters like size and **node degree** in a con- trolled fashion. ... MCI and random topologies, though in Section IV we use a set of regular graphs with different **degrees** of connectivity ... Table I lists the pertinent characteristics of the topologies **used** in our experiments ... Cited by 142 - Related articles - 8L Direct - All 14 versions

Quality of service based routing: A performance perspective - > psu.edu [PDF]

G Apostolopoulos, R Guérin, S Kamat, SK...- ACM SIGCOMM..., 1998 - portal.acm.org ... Specifically, whenever a trigger is acti- vated, the **node's** update message can cover only the specific **link** involved or all of the **node's links**. The trade-off is be- ... Unfortunately, the **degree** of inaccuracy in this ... In addition, the topology of I(c) will be **used** in Section 5 to evaluate the ... Cited by 396 - Related articles - Bt. Direct - All 25 versions

[PDF] № A review of routing and wavelength assignment approaches for wavelength-routed ...

H Zang, JP Jue, B Mukherjee - Optical Networks Magazine, 2000 - Citeseer ... Fixed-alternate routing provides simplic- ity of control for setting up and tearing down lightpaths, and it may also be **used** to provide some **degree** of fault tolerance upon ... 0 1 2 3 4 5 Figure 3: Primary (solid) and alternate (dashed) routes from **Node** 0 to **Node** 2. 0 1 2 3 4 5 ... Cited by 899 - Related articles - View as HTML - All 19 versions

[PDF] Preferred link based delay-constrained least-cost routing in wide area networks

R Sriram, G Manimaran, CSR Murthy - Computer Communications, 1998 - Citeseer ... The maximum number of entries per row is denoted by k. Obviously k is upper- bounded by the maximum **degree** of any ... a call setup packet P belonging to the call-request R ¼ (id,s,d,B,D) arrive at **node** v. For ... A similar idea of residual delay has also been **used** by Kompella et al ... Cited by 39 - Related articles - View as HTML - All 6 versions

A routing protocol for packet radio networks - > psu.edu [PDF]

S Murthy... - Proceedings of the 1st annual international conference ..., 1995 - portal.acm.org The **cost** of the **link** from i to t (i, k) is denoted byl;,. ... This type of up- date message is **used** as a "hello message" from a **node** to allow its neighbors to know that they maintain coectivity. even if no user messages or routing-table updates are exchanged. ... Cited by 171 - Related articles - All 22 versions

Efficient gos routing - > psu.edu [PDF]

S Siachalou, L Georgiadis - Computer Networks, 2003 - Elsevier

... Although pseudopolynomial, tests with a wide variety of networks, **link costs** and **link** constraints, show that the proposed algorithms have fairly satisfactory performance and can be **used** in practical ... Let G=(N,L) be a graph with **node** set N and **link** set L. A **link** with origin ... Cited by 40 - Related articles - BL Direct - All 19 versions

IPDFI ➤ Hierarchical routing using link vectors

J Behrens, JJ Garcia-Luna-Aceves - IEEE INFOCOM, 1998 - Citeseer

... Althoughthe new hierarchical routing algorithm can be **used** with overlappingclusters withonlyminor modifications ... An underlying protocol assures that A **node** detects within finite amount of time the ... All messages transmitted over an operational **link** are re- ceived correctly and in ... Cited by 47 - Related articles - View as HTML - BL Direct - All 14 versions

Finding disjoint paths in networks

D Sidhu, R Nair, S Abdallah - ACM SIGCOMM Computer Communication ..., 1991 - portal.acm.org ... ogy. Another scheme [2] finds multiple paths that are initial-link-disjoint (disjoint in the first link). The method of link-disjoint augmentation [3, 4] was used in [5] to construct a pair of disjoint paths of minimum total cost from every node to a desti- nation. ... Cited by 97 - Related articles - All 2 versions

[PDF] ▶ On the placement of web server replicas

L Qiu, VN Padmanabhan, GM Voelker - IEEE INFOCOM, 2001 - Citeseer

... of the path between two nodes (assuming there is a **cost** associ- ated with the **links** on the ... a super-optimal bound from each value of u 0 . The maximum of the three is **used** as the ... and 300-**node** trees, and we set the maximum distance to 10 and the maximum **node degree** to 10 ... Cited by 476 - Related articles - View as HTML - BL Direct - All 40 versions

An efficient routing protocol for wireless networks - with acin [PDF]

S Murthy, JJ Garcia-Luna-Aceves - Mobile Networks and Applications, 1996 - Springer ... | A marker (tagj) **used** to update routing table; it speci- fies whether the entry corresponds to a simple path (tag) = correct), a loop (tag) = error) or a destination that has not been marked (tagj = null). The **link-cost** table of **node** i lists the **cost** of relaying information through each ... Cited by 822 - Related articles - Ali 6 versions

An iterative algorithm for delay-constrained minimum-cost multicasting - psu.edu [PDF]

M Parsa, Q Zhu, JJ Garcia-Luna-Aceves - IEEE/ACM Transactions on ..., 1998 - portal.acm.org ... In our description and implementation of BSMA we have **used** a -shortest-path algorithm to perform path switching. ... total time complexity of BSMA is In practice we are more interested in **degree**-bounded net- works in which the maximum **degree** of every **node** is upper ... Cited by 140 - Related articles - Bi. Direct - All 16 versions

[PDF] Multicast routing with end-to-end delay and delay variation constraints

GN Rouskas, I Baldine - IEEE Journal on Selected Areas in communications, 1997 - Citeseer ... Tree is then a feasible tree for the new set and can be **used** without any change other ... and the delay along each **link** was set to the propagation delay of light along the **link**. ... 4–6 correspond to networks with average **node degree** equal to 2.5 and multicast groups of sizes equal to ... Cited by 263 - Related articles - View as HTML - BL Direct - All 13 versions

[PDF] № Methods for designing communications networks with certain two-connected ...

CL Monma, DF Shallcross - Operations Research, 1989 - istor.org

... This approach has been **used** successfully for a number of problems including the traveling salesman problem and the graph parti- tioning problem; see Papadimitriou and Steiglitz (1982, Chapter 19) for a general discussion of local ... In all cases, the **degree** of **node** u is ... Cited by 143 - Related articles - All 4 versions

[PDF] Cache-and-relay streaming media delivery for asynchronous clients

S Jin, A Bestavros - International workshop on networked group ..., 2002 - Citeseer

... 4.1 Networks Used in Our Simulations In our simulations, four synthetic and real networks were

used. ... A random power-law **degree** network with 120,037 vertices generated using the model in [2]—namely, the probability of having **node degree** larger than d is proportional ... Cited by 65 - Related articles - View as HTML - All 23 versions

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